

## ABSTRACT OF THE DISCLOSURE

Methods and apparatuses for transposing a matrix using a vector look up unit. In one aspect of the invention, a method for matrix transposition includes: rotating in a vector register a first row of a matrix to generate a first row of elements; writing simultaneously into a plurality of look up units the first row of elements indexed by a first row of indices in a vector register; looking up simultaneously from the plurality of look up units a second row of elements indexed by a second row of indices in a vector register; and rotating in a vector register the second row of elements to generate a third row of elements.